**Presentation Report: TCS Stock Data Analysis.**

**Slide 1: Tittle Slide.**

**Title :- TCS Stock Data Analysis.**

**Subtitle:- Exploratory Data Analysis & Insights.**

**Presented by:[SNEHAL BHAGAT]**

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**Slide 1. Objective.**

**To explore historical stock price data for Tata Consultancy Services (TCS) and develop a machine learning model to predict future prices, aiding investment decisions.**

**2. Dataset Overview**

**Source: TCS\_stock\_history.csv**

**Features:**

**Date, Open, High, Low, Close, Volume, Dividends, Stock Splits**

**Data spans multiple years and captures daily trading metrics.**

**3. Tools & Libraries**

**Python Libraries:**

**pandas, numpy, matplotlib, seaborn**

**sklearn for regression and evaluation**

**Environment: Jupyter Notebook**

**4. Data Preprocessing**

**Missing Values: Identified and handled missing entries in the dataset.**

**Date Conversion: Date column was parsed into datetime format.**

**Summary Statistics: Used .describe() to understand value ranges and distributions.**

**5. Exploratory Data Analysis (EDA)**

**Line Plot: Showcased how Close prices evolved over time.**

**Volume Trends: Investigated trading activity spikes.**

**Price Distribution: Plotted histogram of closing prices.**

**Insights:**

**Clear upward trend with periodic corrections.**

**High trading volume correlates with price shifts.**

**6. Machine Learning Model**

**Model Used: LinearRegression from sklearn**

**Features Used: Open, High, Low, Volume**

**Target: Close price**

**Process:**

**Data split into training and testing sets (e.g., 80/20)**

**Model trained and evaluated on unseen test data**

**: Feature Engineering**

**● Extract features like Year, Month, Day, Day of Week from Date.**

**● Create lag features (e.g., previous day’s close, previous day’s high/low)**

**Conclusion**

**The analysis of TCS stock data reveals clear historical trends and consistent market behavior, reflecting the company's stability and investor confidence. By using linear regression, we demonstrated a foundational approach to predicting closing prices based on key features such as opening price, high, low, and trading volume.**

**While the model performed adequately with a decent R² score and acceptable RMSE, it also highlighted the limitations of simple linear models in capturing the complexities of stock market behavior—especially during periods of high volatility or sudden market shifts.**